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Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

- 5 a. a shank having a head end;  
b. a pointed end portion formed on an entering extremity of said shank  
opposite said head end for insertion through ~~said opening in said~~  
~~metal connector and into~~ said first bore in said wood structural  
10 members;  
c. said shank having a threaded shank portion having thread  
convolutions with an outer diameter greater than the diameter of said  
first bore and beginning at a first point adjacent said pointed end  
portion and extending axially along the periphery of said shank to a  
second point and adapted to form and engage threads in said wood  
15 structural member<sup>S</sup><sub>K</sub>  
d. said shank having a knurled portion formed with a plurality of  
knurls having dull edges and having a first point adjacent said second  
point of said threaded shank portion and extending axially along said  
shank to a second point and having an outside diameter generally  
20 equal to the outer diameter of said thread convolutions in said  
threaded shank portion and having an inside diameter substantially  
less than said outside diameter of said knurled portion and equal to or  
only slightly greater than the diameter of said first bore;  
e. said knurls are formed with a tapered entering portion forming a  
25 smooth transition between the inner diameter of said shank and said  
outside diameter of said knurled portion;  
f. said shank having an unthreaded shank portion having a diameter  
generally equal to said outside diameter of said knurled portion and  
having a first point adjacent said second point of said knurled portion  
30 and extending axially along said shank a distance substantially greater  
than the length of said knurled portion ~~and the thickness of said metal~~  
~~connector at said planar portion~~ and terminating at a second point  
adjacent said head end;  
g. said knurls having said dull edges bend over buckle and crush  
35 without severing, a substantial proportion of the wood fibers of the  
inner portions of said threads formed in said wood structural member<sup>S</sup><sub>K</sub>

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forming a nominal annular zone of bent over buckled and crushed wood fibers, having an outer diameter nominally greater than said diameter of said unthreaded shank portion and forming a tight fit between said unthreaded shank portion and said nominal annular zone of bent over buckled and crushed wood fibers, of said wood structural members;

h. a head integrally connected to said shank at said head end; and

i. said unthreaded shank portion extending a substantial distance within said wood structural members.

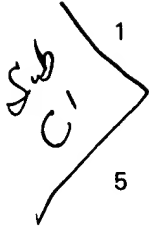
2. In a multi-ply wood structure shear connection including a plurality of wood screw fastener and a <sup>plurality of</sup> wood structural members comprising; said screw fastener including,

a. a shank having a head end;

b. a pointed end portion formed on an entering extremity of said shank, opposite said head end, having a plurality of thread convolutions and a recess providing a cutting edge for ~~insertion through said metal connector and~~ forming a first bore in said wood structural members and having a selected outer diameter;

c. said shank having a threaded shank portion having thread convolutions similar to said thread convolutions on said pointed end portion with an outer diameter greater than said diameter of said first bore and beginning at a first point adjacent said pointed end portion and extending axially along the periphery of said shank to a second end point and adapted to form and engage threads in said wood structural members;

d. said shank having a knurled portion formed with a plurality of knurls having dull edges and having a first point adjacent said second point of said threaded shank portion and extending axially along said shank to a second point and having an outside diameter generally equal to the outer diameter of said thread convolutions in said threaded shank portion and having an inside diameter substantially less than said outside diameter of said knurled portion and equal to or only slightly greater than the diameter of said first bore;



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e. said knurls are formed with a tap red ent ring portion forming a smooth transition between the inner diameter of said shank and said outside diameter of said knurled portion;

f. said shank having an unthreaded shank portion having a diameter generally equal to said outside diameter of said knurled portion and having a first point adjacent said second point of said knurled portion and extending axially along said shank a distance substantially greater than the length of said knurled portion and the thickness of said metal connector at said planar portion and terminating at a second point adjacent said head end;

g. said knurls having said dull edges bend over, buckle and crush without severing, a substantial proportion of the wood fibers of the inner portions of said threads formed in said wood structural members forming a nominal annular zone of bent over, buckled and crushed, wood fibers having an outer diameter nominally greater than said diameter of said unthreaded shank portion and forming a tight fit between said unthreaded shank portion and said nominal annular zone of bent over, buckled and crushed wood fibers of said wood structural member<sup>S</sup>.

h. a head integrally connected to said shank at said head end; and

i. said unthreaded shank portion extending a substantial distance within said wood structural members.

3. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 1 wherein:

a. said wood structural members are trusses having at least one wood member for receipt of said screw.

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4. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 2 wherein:

a. said wood structural members are trusses having at least one wood member for receipt of said screw.

5. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 1 wherein:

a. said wood structural members are wood beams.

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6. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 2 wherein:

a. said wood structural members are wood beams.

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7. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 3 wherein:

a. said wood trusses are roof trusses.

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8. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 4 wherein:

a. said wood trusses are roof trusses.

WOOD STRUCTURAL MEMBERS

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